SR 18: 180th Avenue SE to Maple Valley (Kendal 2)

USACE IP 1999-4-00171

Northwest Region

2006 MONITORING REPORT

Wetland Assessment and Monitoring Program

Issued May 2006

Washington State Department of Transportation

Environmental Services Office

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SR 18: 180th Avenue SE to Maple Valley (Kendal 2)

USACE 1999-4-00171

General Site Information	
USACE IP Number	1999-4-00171
WSDOT Contract Number	C6008
Mitigation Location	Adjacent to SR 18 westbound, west of Big Soos Creek, King County
Construction Date	2003
Initial Monitoring Period	2004 – 2013
Year of Monitoring	3 of 10
Area of Project Impact	0.14 acres
Type of Mitigation	Wetland Creation
Area of Mitigation	0.28 acres

Summary of Monitoring Results and Management Activities

Performance Criterion		Results	Management Activities
Permit Requirement (USACE)			
	Creation and restoration areas will be saturated to the surface for 12.5 percent of the growing season.	Most of the intended wetland area has clearly met the wetland hydrology criterion.	
Success Standard (2005)			
1.	Create at least 0.28 acres that support wetland hydrology.	> 0.28 acres support wetland hydrology	
3a.	At least 60% cover by at least three non-invasive native herbaceous FACW and wetter species in the emergent wetland.	11% ($CI_{80\%}$ = 8-15%)	
3b.	At least 15% cover by at least three species of FAC and wetter native woody plant species in the forested wetland.	63% ($CI_{80\%}$ = 55-71%)	
5a.	Control all King County-listed Class A, B-designate, and County-selected priority noxious weed species.	Weed Control	Ongoing weed control
5b.	Less than 25% cover by reed canarygrass in the enhancement and restoration areas.	17% ($CI_{80\%}$ = 10-24%)	Ongoing weed control
9.	Habitat structures in the plans in place and functional.	Present and functional	

Report Introduction

This report summarizes Year 3 monitoring activities at the State Route (SR) 18: 180th Avenue SE to Maple Valley (Kendal 2) mitigation site. Included is a description of the site, the success criteria, an explanation of how the site was monitored, and a discussion of how it is developing. Monitoring activities documented in this report include 2005 vegetation surveys, photo-documentation, and 2006 hydrology observations.

What is the SR 18 Kendal 2 Mitigation Site?

The SR 18 Kendal 2 mitigation site is located southwest of the SR 516 and SR 18 interchange in King County. This site was constructed as partial mitigation for a permit deviation when a small group of trees were cleared in Wetland KA during project construction. Upland areas were excavated to intercept ground water, flood flows, and local runoff. Excavation resulted in a gently sloping wetland that borders the riparian wetlands associated with Big Soos Creek. Native plants, brush piles, and root wads were installed to enhance fish and wildlife habitat. The goals of the mitigation site were to provide floodwater attenuation, food chain support and wildlife habitat.

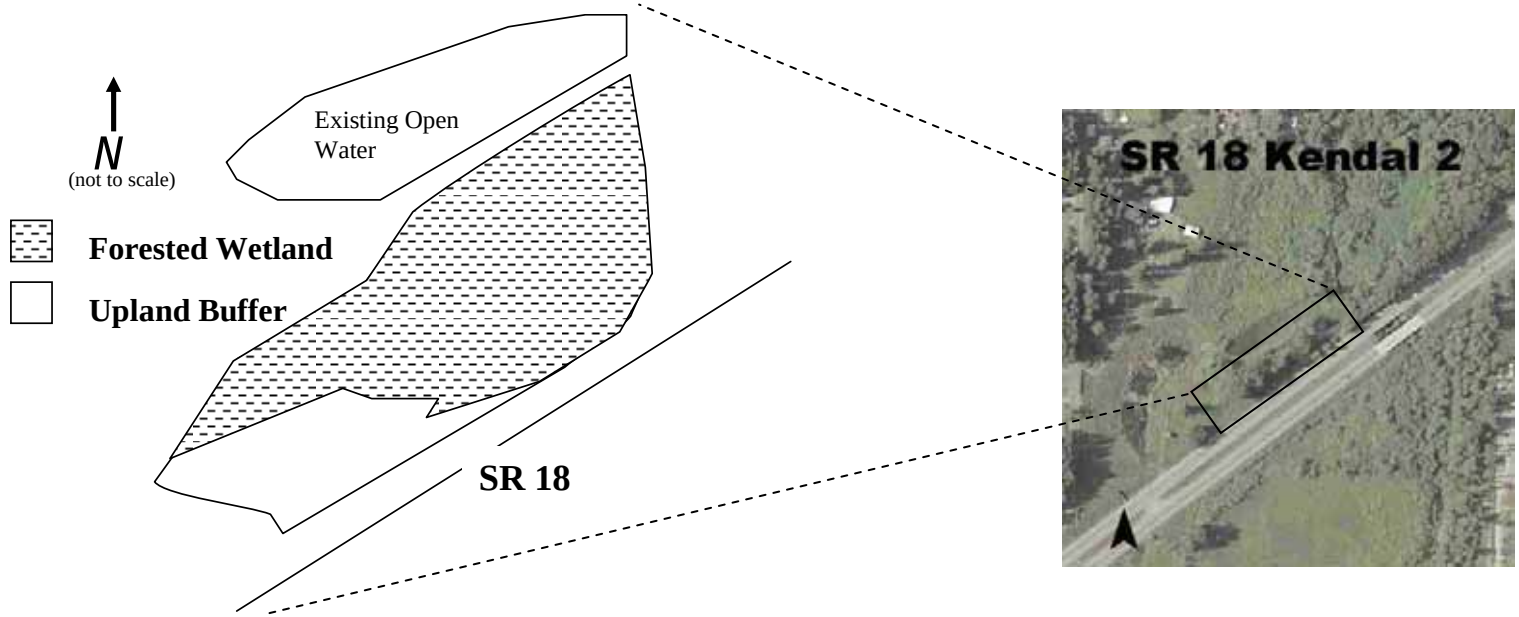


Figure 1 Site Sketch
The site has a combination of forested wetlands and upland buffer. Appendix 1 includes directions to the site.

What are the performance criteria for this site?

Permit Requirement 1
Creation and restoration areas must be saturated to the surface. Saturation must be to the surface for at least 12.5 percent (30 consecutive days) of the growing season (March 1 through October 31). Saturation will be measured by observing soil saturation to the surface or by utilizing water wells.

Performance Standard 1
The mitigation is intended to create 0.28 acres of scrub shrub wetland dominated by native plant species.

Performance Standard 3a
Three years after planting, emergent wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 60% or more areal (*sic*) cover involving at least three non-invasive herbaceous plant species adapted for life in saturated soil conditions (facultative-wet or wetter).

Performance Standard 3b
Forested wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 15% or more areal (*sic*) cover involving at least three species of woody plant species adapted for life in saturated soil conditions (facultative or wetter).

Performance Standard 5a
All King County-listed Class A, B-designate, and County-selected priority noxious weed species will be controlled in the season they are first identified on the mitigation site.

Performance Standard 5b
The enhancement and restoration areas shall contain no more than 25% areal (*sic*) cover by reed canarygrass at any point during the lifetime of the monitoring period.

Performance Standard 9
Habitat structures identified in the plans are still in place and functional.

Appendix 1 provides the complete text of the performance criteria for this project, and Appendix 4 shows the planting plan (Antieau and Krueger 2001).

How were the success standards measured?

Quantitative data were collected in 2005 to evaluate the third year performance standards and permit requirements. A baseline was established through the site from west to east (Figure 2). Twenty-five transects were randomly placed perpendicular to the baseline. The point intercept method was used to estimate cover of native emergent vegetation and non-native invasive species (Performance Standards 3a, 5a and 5b).

To provide additional site information, tree and shrub growth in the buffer and wetland plant communities were evaluated. The line intercept method was used to estimate woody cover (Performance Standard 3b).

Primary and secondary field indicators of wetland hydrology (Ecology 1997) were recorded to address Permit Requirement 1. These observations were made during four site visits in March and April 2006. Five soil pit locations were also selected in the wetland areas of the site. Wetland hydrology was assessed at these locations during the site visits.

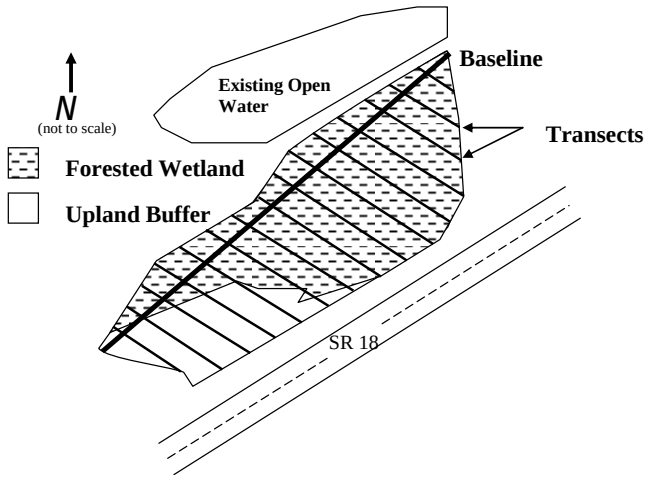


Figure 2 Sample Design (2005)

Photographs were taken at permanent photo points to address Permit Requirement 2.

To address Performance Standard 1, Washington State Department of Transportation (WSDOT) staff performed a wetland delineation in March 2005 using methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) and a Global Positioning System (Trimble TSCI data logger).

Habitat structures were counted to address Performance Standard 9.

For additional details on the methods, see Appendix 2 of this report or view the WSDOT Wetland Mitigation Site Monitoring Methods at: http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf

How is the site developing?

In the third year of monitoring, the site is developing into a young forested wetland. An adjacent pond transitions to the mitigation site with a young forested wetland zone that is partly surrounded by an upland buffer and mature vegetation. Native herbaceous species are beginning to volunteer as an understory to the forested wetland zone. Woody plantings are well established, and are beginning to provide structural diversity to the site. Habitat structures provide foraging sites and cover opportunities for birds and other wildlife. Flood flow de-synchronization is provided by the wetland when the adjacent pond (which is connected to detention ponds) overflows into the site after storm events. Food chain support is provided as detritus and leafy debris generated on the mitigation site are transported to Big Soos Creek.

Results for Permit Requirement 1
(Creation and restoration areas must be saturated to the surface for at least 12.5 % of the growing season):

Although data are somewhat inconclusive, it appears the standard has been met (see Appendix 3). A wetland delineation conducted in March 2005 suggests the site has the intended wetland area. Surface and sub-surface observations demonstrate a majority of the intended wetland has adequate hydrology (Photo 1).

Photo 1

Surface water in the forested wetland (April 2006).

Results for Performance Standard 1
(Create 0.28 acres of scrub-shrub wetland dominated by native plant species):

A mid-course wetland delineation was conducted in March 2005. The wetland area was greater than required, and is dominated by native plant species (Photo 2). Although a small section of the wetland area is dominated by *Phalaris arundinacea* (reed canarygrass), weed control is ongoing.

Photo 2

Wetland area at Kendal 2 (April 2006).

Results for Performance Standard 3a
(≥60% cover by at least three non-invasive native herbaceous facultative-wet and wetter species in the emergent wetland):

The estimated cover of non-invasive native herbaceous facultative-wet (FACW) and wetter species in the wetland is 11% ($CI_{80\%}$ = 8-15%) (Photo 3). Though this cover value does not approach the performance standard, target plant species are beginning to colonize areas of the emergent wetland. A layer of sheet mulch has probably affected the rate of natural colonization in this area.

Ten FACW and wetter herbaceous plant species were observed during monitoring activities in 2005 and 2006. Appendix 3 contains a complete list of observed native herbaceous species.

Photo 3

Volunteer emergent vegetation (April 2006).

Results for Performance Standard 3b
(≥15% cover by at least three species of FAC and wetter native woody plant species in the forested wetland):

The estimated aerial cover by native FAC and wetter woody plants is 62% ($CI_{80\%}$ = 54-70%) (Appendix 3). This estimate exceeds the cover requirement for Year 3. Eleven tree and shrub species are well established in the wetland (Photo 4). *Alnus rubra* (red alder) dominates the forest canopy with two to three meters as an average height. The shrub layer is comprised of *Lonicera involucrata* (twinberry), *Picea sitchensis* (Sitka spruce), *Pseudotsuga menziesii* (Douglas-fir), and *Symphoricarpos albus* (snowberry). Shrubs average about one meter in height.

Results for Performance Standard 5a
(Control all King County-listed Class A, B-designate, and County-selected priority noxious weed species):

Weed control activities have occurred annually, targeting noxious weeds and other potentially invasive species. Observed species are presented in Appendix 3. These species provide only a trace amount of cover.

Photo 4

Woody species cover in the wetland (April 2006).

Results for Performance Standard 5b
(The enhancement and restoration areas shall contain no more than 25% areal (*sic*) cover by reed canarygrass at any point during the lifetime of the monitoring period.):

Annual weed control efforts have limited the estimated cover of *P. arundinacea* to 17% ($CI_{80\%}$ = 10-24%). Adjacent areas to the northeast are dominated by *P. arundinacea*, and have probably contributed propagules to the mitigation site. Currently, *P. arundinacea* does not appear to be posing a risk to site development.

Results for Performance Standard 9
(Habitat structures identified in the plans are still in place and functional):

All habitat structures identified in the plans are still in place and functional (Photo 5). Field observations suggest that both brush piles and root wads are providing cover for amphibians and other wildlife on site.

Photo 5

Habitat structure in the wetland (April 2006).

Appendix 1A - Success Standards and Addendum

The following excerpt is from the *SR 18: 180th Ave SE to Maple Valley, Washington (MP 12.57 to MP 16.55) Final Wetland Mitigation Plan* (Antieau and Krueger 2001) and the *SR 18: 180th Ave SE to Maple Valley, Washington, Updated Wetland Mitigation Plan Addendum* (Brown 2002). The criteria addressed this year are identified in **bold** font. Other tasks and standards will be addressed in the indicated monitoring year.

5.6 Success Standards

5.6.1 Mitigation Goals

The goal of the proposed mitigation is to replace temporal losses of wetland type, acreage, and functions. The proposed mitigation intends to create 0.28 acre of scrub-shrub wetland. The proposed mitigation site is anticipated to provide the following functions:

- Floodwater attenuation: This function is provided with increased floodplain area.
- Food chain support: This function is provided with increased detritus/leafy debris input to Big Soos Creek.
- Wildlife Habitat: This function is provided with increased vegetative community diversity, increased structural diversity, and installation of habitat structures.

5.6.2 Objectives and Performance Standards

The objectives and performance standards presented in the plan will be maintained for the additional mitigation area ad noted below:

Objective 1. Wetland Areal Extent and Wetland Hydrology

The wetland mitigation action must demonstrate a total of 0.28 acres or more that support wetland hydrology. Hydrology in the wetland creation will be monitored in monitoring years five and ten.

Performance standards: Monitoring Years One Through Ten

PS1. **The creation areas must demonstrate a total of 0.28 acres or more that support wetland hydrology.**

Monitoring/Delineation Schedule
Same as stated in the plan.
"A determination of areal extent will be made during the hydrology monitoring period using standard wetland delineation methodology using these monitoring data. The boundary and areal (*sic*) extent of the area supporting wetland hydrology will be determined using an instrument survey or other reliable method of determining area."

Potential contingency Actions
Same as stated in the plan.
"Regrade the site to achieve the required acreage supporting hydroperiods that meet the hydrology criterion for wetlands (Environmental Laboratory 1987)- "hydrology criterion" inundation or saturation within 12 inches of the surface for 12.5% of the growing season March 1-October 31."

Objective 2. Vegetation
The mitigation is intended to create 0.28 acres of scrub shrub wetland dominated by native plant species.

Performance standards Monitoring Year One
PS2. Same as stated in the plan.
"At the end of the first growing season all planted material shall be alive and healthy (all dead material will be replaced). **The enhancement and restoration areas shall contain no more than 25% areal** (*sic*) **cover by reed canarygrass at any point during the lifetime of the monitoring period**."

Performance Standards Monitoring Year Three
PS3. Same as stated in the plan, except no emergent vegetation will be planted.
"**Three years after planting, emergent wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 60% or more areal** (*sic*) **cover involving at least three non-invasive herbaceous plant species adapted for life in saturated soil conditions (facultative-wet or wetter). Forested wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 15% or more areal** (*sic*) **cover involving at least three species of woody plant species adapted for life in saturated soil conditions (facultative or wetter**)."

PS4. Does not apply to this mitigation site

PS5. Same as stated in the plan.

"All King County-listed Class A, B-designate, and County-selected priority noxious weed species will be controlled in the season they are first identified on the mitigation site.

Reed canarygrass (a King County Weed of Concern) is expected to be present during the life of this mitigation effort due to the abundant and adjacent source of propagules, as well as the presence of reed canarygrass on the mitigation site. The enhancement and restoration areas shall contain no more than 25% areal (*sic*) **cover by reed canarygrass at any point during the lifetime of the monitoring period."**

Performance standards: Monitoring Year Five, Seven and Ten
PS6. Same as stated in plan, except emergent vegetation will not be planted.
"Five years after planting, emergent wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 75% or more areal (*sic*) cover involving at least three non-invasive herbaceous plant species adapted for life in saturated soil conditions (facultative-wet or wetter). Forested wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 25% or more areal (*sic*) cover involving at least three species of woody plant species adapted for life in saturated soil conditions (facultative or wetter)."

PS7. Does not apply to this mitigation site.

Monitoring/Delineation schedule
Same as stated in the plan.
"Monitoring schedule-Once during the middle part of the growing season in Monitoring Years One, Two, Three, Five, Seven, And Ten."

Potential Contingency Actions
Same as stated in the plan.
"Before the beginning of Monitoring Year One, all dead or unhealthy plants will be replaced. Thus, monitoring 100% survival in Monitoring Year One (Performance Standards PS2) will be verifying this.

If the site does not meet performance standards PS4 and PS5 (Monitoring Year Three), additional planting will be conducted. Live, containerized plant material will be replanted and monitored to assure that coverage meets performance standards S6 and S7 (Monitoring Year Five).

If the site does not meet performance standards PS6 (vegetation not succeeding in directions that displace or weaken reed canarygrass), and PS7 and PS8 (Monitoring Year Five), resource agencies will be consulted for advice on further measures to remedy problems at the site. The monitoring schedule will be extended and such reasonable measures will be conducted as necessary to establish appropriate wetland vegetation. WSDOT will perform all reasonable measures considered necessary to establish and maintain a functioning wetland/buffer system that meets the goals and objectives of this monitoring plan.

The mitigation plan uses and promotes the growth of native vegetation. **King County Class A, B-designate, and County-selected priority noxious weed species will be controlled in the season they are first identified on the site. In the event that reed canarygrass in the enhancement and restoration areas exceeds 25% areal** (*sic*) **cover at any point during the monitoring period, a range of techniques will be employed to bring the area into compliance.** These techniques include hand pulling and off-site disposal, hand-spraying or wiping with Rodeo, flaming, trampling (crushing), and/or mowing."

Objective 3 Wildlife Habitat

Wildlife cover and forage availability for birds and mammals should increase substantially. The addition of fruit and nut bearing shrubs, brush piles, and root wads will increase habitat diversity and structural complexity in newly vegetated areas. Overall, creating a scrub-shrub wetland community is intended to provide feeding, breeding, and nesting habitat for birds, mammals, and amphibians.

Performance Standards: Monitoring Year One

PS8. Same as stated in the plan.

"All habitat structures identified on the plan have been placed on the site."

P.S. Year 2 and 3

PS9. Same as stated in the plan.

" **Habitat structures identified in the plans are still in place and functional**."

P.S. Year 5, 7, and 10

Same as stated in the plan (none).

Monitoring schedule

Same as stated in the plan.

"Once during Monitoring Years One, Two, and Three."

Potential Contingency Actions
Same as stated in the plan.
"Install or replace habitat structures that are missing, damaged, lost, or non-functional."

5.7 Monitoring Plan
Same as stated in the plan.
"WSDOT's Wetland Mitigation Monitoring Program (Monitoring Program) uses objective-based monitoring to document success and change in WSDOT's wetland mitigation sites. Monitoring protocols are based on specific objectives written in each project's wetland mitigation plan, combined with evaluation of current site conditions. A customized monitoring program is developed for each site. The Monitoring Program uses a variety of ecological monitoring techniques and protocols, including those outlined in Horner and Raedeke (1989) and in WSDOT (2000b). Many standard techniques such as permanent transect lines, plots, and photo points are still used. However, the number and placement of those depend on specific site objectives. Locations of photopoints and transects, if used, are not selected until the first year of monitoring. Statistical precision and accuracy are used to determine the number and configuration of transects and sample plots.

The Monitoring Program will begin monitoring hydroperiod in the wetland creation portion of the site immediately after completion of the grading plan, but prior to construction of the planting plan. During this period, hydrology will be monitored at least twice monthly using shallow groundwater wells or other means of observing soil saturation/inundation. After the planting plan has been constructed, Monitoring Year One will commence at the start of the subsequent year. Beginning with the first growing season after construction of the planning plan, the Monitoring Program will monitor the mitigation site for at least ten years. Parameters to be monitored during this ten-year period include hydroperiod and vegetation, as described above.

Reports for the ten-year monitoring period (including a report for each Monitoring Years One, Two, Three, Five, Seven, and Ten) will be issued to the Corps of Engineers Seattle District Regulatory Branch, Washington State Department of Ecology, King County Department of Development and Environmental Services, and other appropriate resource agencies for review and comment. Successful mitigation will be measured by attainment of the performance standards described in this mitigation plan document. Monitoring may be curtailed early or reduced in intensity if the mitigation effort meets the stated performance standards earlier than anticipated."

5.8 Contingency Actions
Same as stated in the plan.
"WSDOT anticipates the mitigation goal will be achieved by accurately completing the grading and planting plans. However, contingency actions, as described above, may be needed to correct unforeseen problems. Such actions may consist of regarding

the site in the case of insufficient hydroperiod, or replanting the site in the case of planting failure. However, natural recruitment of native wetland species and upland species (in the buffer) will be counted toward achieving performance standards for Vegetation. Should areal coverage of wetland or buffer plants consistently fall short of desired performance standards, WSDOT will consult with appropriate agencies in determining what additional measures could be implemented to ensure establishment of viable wetland and upland plant communities."

Appendix 1B – Permit Requirements

From USACE Regulatory Branch Letter (2002, p.2) (Individual Permit 1999-4-00171)
The performance standard for wetland hydrology listed below supercedes the performance standard described in the "Final Wetland Mitigation Plan, SR 18: 180th Avenue SE to Maple Valley, Washington (MP 12.57 to MP 16.55) by Clayton J. Antieau, wetland Biologist and Paul. W. Krueger, Landscape Designer, and amended by John Maas and Terry Sullivan, WSDOT, Northwest Region" dated January 2001 and "SR 18: 180th Avenue SE to Maple Valley, Washington, Updated Wetland Mitigation Plan Addendum" dated August 15, 2002.

> **Performance Standard 1: Creation and restoration areas must be saturated to the surface. Saturation must be to the surface for at least 12.5 percent (30 consecutive days) of the growing season (March 1 through October 31). Saturation will be measured by observing soil saturation to the surface or by utilizing water wells.**
>
> In sandy soils, water must be standing in the well at 6 inches or less for at least 12.5 percent of the growing season. **In non-sandy soils, water must be standing in the well at 12 inches or less for at least 12.5 percent of the growing season.**

From Ecology Water Quality and Certification Permit 1999-4-00171 (2000, p. 7)
The Applicant shall prepare and submit annual monitoring reports to Ecology's Sarah Suggs and Sandra Manning, P.O. Box 47600, Olympia, WA 98504-7600 no later than December 30th of each year following the first year of project completion. **Each year's monitoring report shall include photographic documentation of the project taken from permanent reference points (Figure 1B.1).**

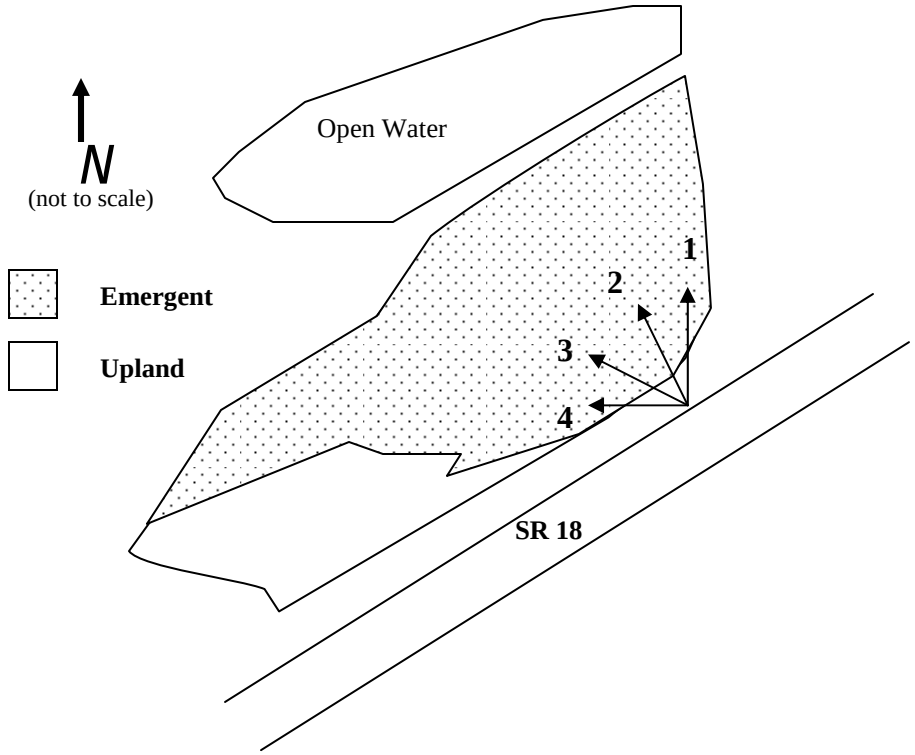


Figure 1B.1 SR 18 Kendal 2 Site Sketch with Photo Point Locations (2006)

Photo Point 1

Photo Point 2

Photo Point 3

Photo Point 4

Appendix 2 - Methods

To address Performance Standard 1, Washington State Department of Transportation (WSDOT) staff performed a wetland delineation in March 2005 using methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) and a Global Positioning System (Trimble TSCI data logger). Photographs were taken at permanent photo points to address Permit Requirement 2.

Primary and secondary field indicators of wetland hydrology (Ecology 1997) were recorded to address Permit Requirement 1. These observations were made during four site visits in March and April 2006. Wetland hydrology was assessed at two soil pit locations in the same general location three times throughout the growing season. The pits were located in the more elevated portions of the wetland (Appendix 3).

To evaluate standards for vegetative cover, a 100-meter baseline was established through the site from west to east (Figure 2). Twenty-five transects were randomly placed perpendicular to the baseline using a systematic random sampling method.

The point intercept method was used to estimate cover of native FACW and wetter vegetation and non-native invasive species (Performance Standards 3a, 5a and 5b). Fifty-one randomly positioned 5-meter point-line sample units (20 points each) were placed along sampling transects across the wetland area. Twenty-four randomly positioned 20-meter point-line sample units (40 points each) were placed along sampling transects across the entire site to address cover of *P. arundinacea*.

$$n = \frac{(z)^2 (s)^2}{(B)^2}$$

z = standard normal deviate
s = sample standard deviation
B = precision level
n = unadjusted sample size

To provide additional site information, tree and shrub growth in the wetland plant community was evaluated. The line intercept method was used to estimate woody cover (Performance Standard 3b). Forty-nine 5-meter lines were randomly placed along the sampling transects in the forested wetland.

Sample size analysis confirmed sufficient sampling had been completed based on site sampling objectives and the desired level of statistical confidence. The sample size equation shown here (upper right) was used to perform this analysis.

Habitat structures were counted to address Performance Standard 9.

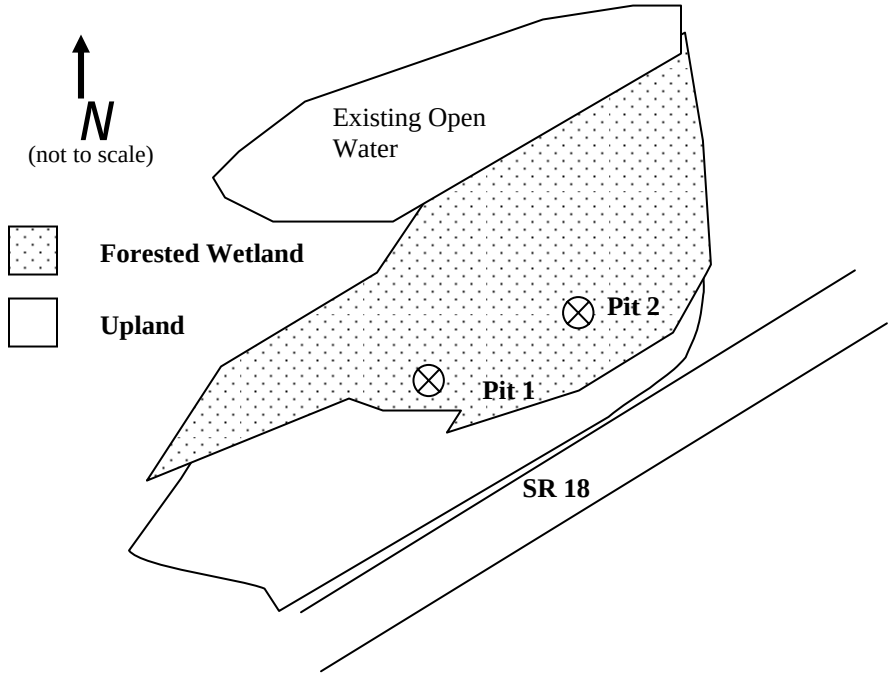
For additional details on the methods described above view WSDOT Wetland Mitigation Site Monitoring Methods at:
http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf

Appendix 3 - Data Tables

Table 1 SR 18 Kendal 2 Hydrology Observations (Spring 2006).

Date	Pit 1	Pit 2
3/20/06	Soils saturated to the surface.	The soil was moist but no saturation or standing water was observed down to 18 inches.
4/16/06	Soils saturated to the surface.	Soils saturated to the surface.
5/01/06	Soils only moist to 17 inches after 20 minutes.	Soil saturated to the surface. Water enters pit instantly at 11 inches below the soil surface.

Figure 1 SR 18 Kendal 2 Hydrology Pit Locations (Spring 2006).



Appendix 3 - Data Tables (continued)

Table 2 Native Woody Species Observed, Summer 2005

Scientific Name	Common Name	Wetland Indicator Status
FAC and Wetter Species		
Alnus rubra	red alder	FAC
Cornus sericea	redosier dogwood	FACW
Fraxinus latifolia	Oregon ash	FACW
Lonicera involucrata	twinberry	FAC+
Physocarpus capitatus	Pacific ninebark	FACW-
Populus balsamifera	black cottonwood	FAC
Rubus spectabilis	salmonberry	FAC+
Salix lucida	Pacific willow	FACW+
Salix sitchensis	Sitka willow	FACW
Spiraea douglasii	hardhack	FACW
Thuja plicata	western red cedar	FAC
Other Species		
Acer circinatum	vine maple	FAC-
Picea sitchensis	Sitka spruce	FAC
Pseudotsuga menziesii	Douglas-fir	FACU
Rosa sp.	roses	
Symphoricarpos albus	snowberry	FACU

Appendix 3 - Data Tables (continued)

Table 3 Native Non-Invasive Herbaceous Wetland Species, Summer 2005

Scientific Name	Common Name	Wetland Indicator Status
FACW and Wetter Species		
Carex stipata	sawbeak sedge	OBL
Epilobium ciliatum	fringed willowherb	FACW-
Equisetum telmateia	giant horsetail	FACW
Geum macrophyllum	largeleaf avens	FACW-
Impatiens noli-tangere	yellow touch-me-not	FACW
Juncus acuminatus	tapertip rush	OBL
Juncus bufonius	toad rush	FACW
Juncus effusus	soft rush	FACW
Myosotis laxa	bay forget-me-not	OBL
Rumex aquaticus	western dock	FACW+
Typha latifolia	broadleaf cattail	OBL
Veronica americana	American speedwell	OBL
Other Species		
Galium aparine	cleavers	FACU
Urtica dioica	stinging nettle	FAC+

Table 4 King County Noxious Weeds, Summer 2005

King County Class B Weeds	King County Noxious Weeds of Concern	Obnoxious Weeds
Senecio jacobaea (tansy ragwort)	*Buddleja davidii* (orange eyed butterfly bush)	*Rubus armeniacus* (Himalayan blackberry)
	Cirsium arvense (Canada thistle)	
	Cirsium vulgare (bull thistle)	
	Daucus carota (Queen Anne's lace)	
	Tanacetum vulgare (common tansy)	
	Hypericum perforatum (common St. Johnswort)	

Appendix 3 - Data Tables (continued)

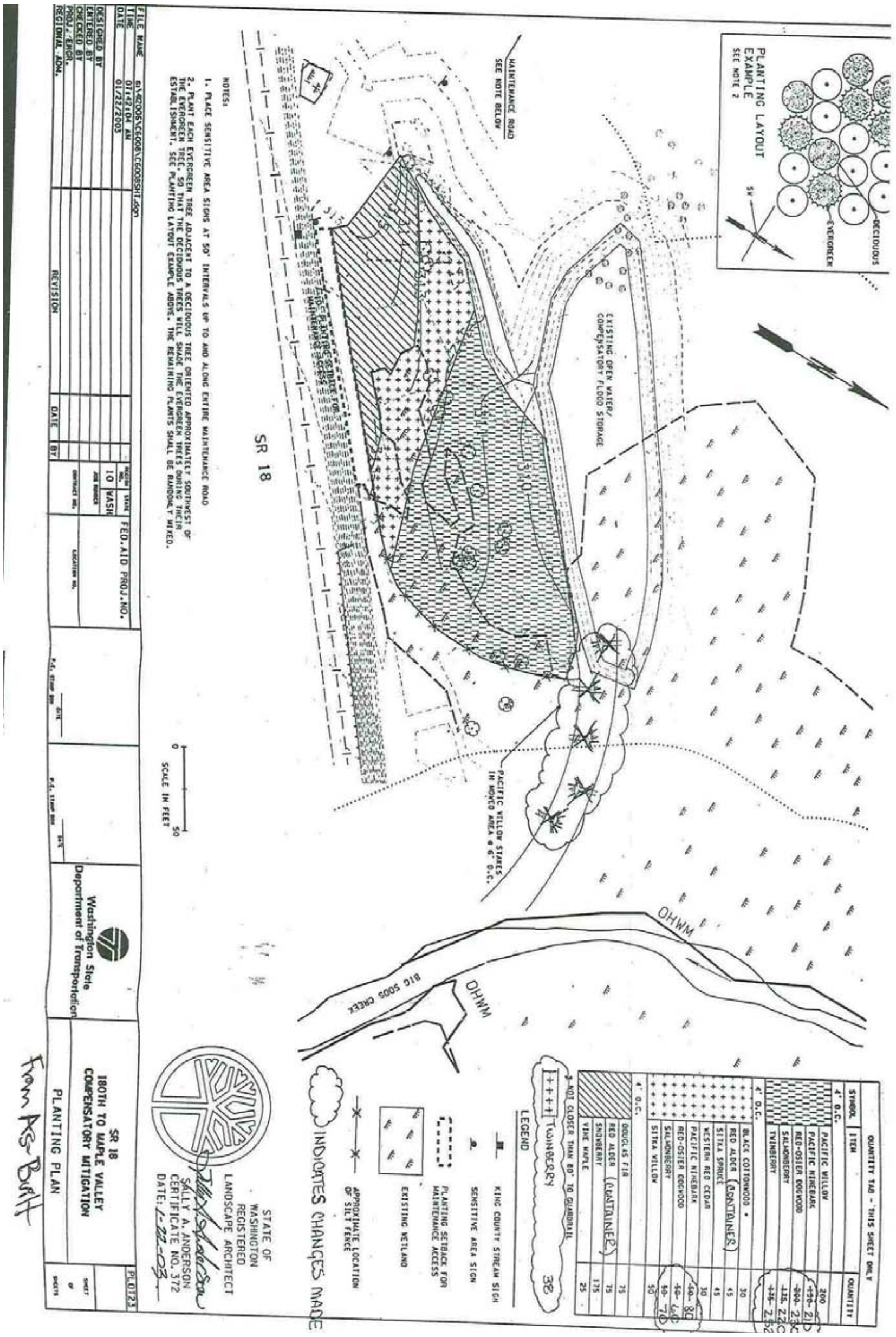
Table 5 Bird Species Observed 2005-2006

***F*AMILY NAME**	**COMMON NAME**	**SCIENTIFIC NAME**	**STATUS[1]**
Accipitridae	Red-tailed Hawk	*Buteo jamaicencis*	
	Rough-legged Hawk	*Buteo lagopus*	
Charadriidae	Killdeer	*Charadrius vociferus*	Wetland-associated
Picidae	Hairy Woodpecker	*Picoides villosus*	
	Downy Woodpecker	*Picoides pubescens*	
	Pileated Woodpecker	*Dryocopus pileatus*	
Corvidae	Steller's Jay	*Cyanocitta stelleri*	
	American Crow	*Corvus brachyrhynchos*	
Hirundinidae	Violet-green Swallow	*Tachycineta thalassina*	Wetland-associated
Paridae	Black-capped Chickadee	*Poecile atricapillus*	Wetland-associated
Turdidae	American Robin	*Turdus migratorius*	
Sturnidae	European Starling	*Sturnus vulgaris*	
Bombycillidae	Cedar Waxwing	*Bombycillia cedrorum*	
Parulidae	Common Yellowthroat	*Geothlypis trichas*	Wetland-dependent
Emberizidae	Savannah Sparrow	*Passerculus sandwichensis*	
	Song Sparrow	*Melospiza melodia*	
	White-crowned Sparrow	*Zonotrichia leucophrys*	
Icteridae	Red-winged Blackbird	*Agelaius phoeniceus*	Wetland-dependent
Fringillidae	House Finch	Carpodacus mexicanus	
	American Goldfinch	Carduelis tristis	

[1] Birds are assigned a wetland-dependent and wetland associated status based on habitat preference and the classification scheme presented in Brown and Smith (1998). Regional variation occurs. References used to further classify species include Thomas (1979), Ehrlich et al. (1988), Smith et al. (1997), and other sources.

Appendix 4 – Planting Plan

(Antieau and Krueger 2001)



)

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